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ABSTRACT

A synopsis of the 1973-74 annual report for the Del Mod System is presented. The activities described were conducted by the University of Delaware, Delaware State College, Delaware Technical and Community College, and the Department of Public Instruction. Activities of field agents, several local district projects, and individual teacher grants are noted in summary form. The descriptions are summaries of more comprehensive reports on file in the Del Mod office in Dover, Delaware. A summary of the projects by project number, title, and director is presented in table form. A list of the Del Mod personnel, 1973-1974, is included. (EB)

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DEL MOD AT A GLANCE

1973-1974

A SYNOPSIS OF THE ANNUAL REPORT

SE020388

DEL MOD AT A GLANCE, VOLUME III

1973-1974 ANNUAL REPORT FOR THE DEL MOD SYSTEM

Dr. John R. Bolig

Director of Research

Del Mod System

October 30, 1974

Printed and disseminated through the office of the Del Mod Component Coordinator for the State Department of Public Instruction
John G. Townsend Building, Dover, Delaware 19901

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Charlotte H. Purnell, *State Director*
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INTRODUCTION

Del Mod activities during 1973-1974 were conducted by the component institutions: the University of Delaware, Delaware State College, Delaware Technical and Community College, and the Department of Public Instruction. The Del Mod office in Dover also supervised the activities of field agents, several local district projects, and individual teacher grants.

This report will attempt to credit each Del Mod activity to the appropriate component, but it should be noted that to do so over simplifies the workings of the System. Many projects and activities are dependent upon efficient use of human and physical resources from several or all of the component institutions. School district projects often drew upon additional resources.

Projects which were designed to benefit one or more teachers, and which were conducted over a range of one day to a year, and which covered one topic or many, are briefly described. The descriptions are summaries of more comprehensive reports on file in the Del Mod office in Dover. It has been the policy of Del Mod to require each project director to evaluate and report on his or her project.

Projects should be viewed in the context of a system. Very few projects exist independent of a past history of demonstrated need, or independent of future implications. The interrelationships are very complex from an evaluative viewpoint, but very easily understood if Del Mod is viewed as a social system operating within the confines of a very small State wherein a phone call may be the first and most important step in bringing together the resources necessary to solve an educational problem.

Charlotte H. Purnell
State Director
Del Mod System

SUMMARY OF PROJECTS
JULY 1973 - JUNE 1974

Project No.	*Title*	*Director*
73-1	Mathematics Inquiry - Conrad School District	Richard Koch
73-2	Physical Science Mathematics Workshop, Wilmington District	Paul Rogle, Meredith Griffin
73-3	K-4 Curriculum Development, Alexis I. duPont District	Thomas Hounsell
73-4	Curriculum Guidelines in Science/ Math/Environment	John Reiher Thomas Baker
73-5	Math Activities for Student Involvement, Mt. Pleasant District	Charles Eisenbise
73-6	Milford District Science Articulation	Glenn Moyer James Gussett
73-7	T. I. E. S. Project	John Reiher William Geppert Thomas Baker
73-8	Math Curriculum Development K-8, Seaford District	Arthur Ellis
73-9	Science Grades 2-4, Appoquinimink District	Dennis Reilly
73-10	SAPA and Environmental Education - Alfred I. duPont District, K-3	Dennis Reilly
73-11	Summer Elementary School Physical Science Workshop, Marshallton/McKean District	Winston Cleland
73-12	Science Curriculum Study - Grades 5-12, Laurel District	Dorothy Taylor James Gussett
73-13	Indian River District Mathematics Guidelines, K-8	Ralph Mahan
73-14	Caesar Rodney Activity Centered Math	Winifred Cooper
73-15	Sequential Skills in Science - New Castle-Gunning Bedford School District	Barbara Logan Peter Shannon Hess Wilson
73-16	Environmental Education Field Studies, Wilmington District	Michael Riska

Project No.	*Title*	*Director*
73-17	Primary Science Workshop, K-4 Caesar Rodney District	Darlene Bolig James Gussett
73-18	Field Agent Activities - New Teachers	James Gussett
73-19	Field Agent Activities - Follow-up of 1972-73 Teachers	James Gussett
73-20	Field Agent Activities - New Teachers	Barbara Logan
73-21	Culture Center	Robert Loynd
73-22	Stanton District - Science Articulation	Barbara Logan
73-23	Applications of Mathematics for Secondary Teachers (Fall)	Clifford W. Sloyer
73-24	Science Education Technology	Mary Stein
73-25	APA Grades 3-4 Capital School District	Dennis Reilly
73-26	Science K-4, Marshallton-McKean District	Dennis Reilly
73-27	Applications of Mathematics for Secondary Teachers (Spring)	Clifford W. Sloyer
73-28	Chemistry Education Project (Fall)	Wayne Anderson
73-29	Chemistry Education Project (Spring)	Wayne Anderson
73-30	Alternatives to General Mathematics	William P. Fentzloff
73-31	UPSTEP - Undergraduate Preservice Teacher Education	Ralph Hazelton Columbus Ricks
73-32	Astronomy for Middle and Secondary School Teachers	Eshan Helmy
73-33	Math/Science Lab	Philip Capriotti
73-34	Math Field Agent - New Castle County	Pete Shannon
73-35	Math Field Agent - Kent/Sussex Counties	Richard Cowan
73-36	Inservice Programs (October)	John Reiher Thomas Baker
73-37	Science Project for Claymont Middle School	Barbara Logan Frank Gavas

Project No.	*Title*	*Director*
73-38	Science Curriculum Development for Mount Pleasant Middle School	Barbara Logan Jack Rockwell Steward Harrison
73-39	Motions in Space	Helen Moncure John Reiher William Geppert
73-40	Metric Task Force	Thomas Baker
73-41	Wilmington Science Intern	Meredith Griffin
73-42	Comet Kohoutek	John Reiher Thomas Baker
73-43	Field Workshop - Math	John Reiher William Geppert Thomas Baker
73-44	Algebra by Computer	Rhoda Witlin
73-45	Field Workshop - Science	John Reiher Thomas Baker
73-46	Field Workshop-Environmental Education	John Reiher Rober Daum
73-47	Inservice Programs (March)	John Reiher Thomas Baker
73-48	Math Computation Improvement Alfred I. duPont District	Lawrence Furbush Frank Marburger
73-49	Del Mod Field Agent Study	John Bolig Horace Darlington
73-50	Basic Arithmetic Teaching Package	William Adkins
73-51	Teacher Produced Slides for the Behavioral Shaping of Math Tasks in Elementary Algebra and Physics	Thomas Townsend
73-52	Business and Consumer Math for the Junior High School Student	J. Leverne Myers
73-53	Development of a Resource Center for Individualized Mathematics	Kathryn Petrick
73-54	Field Agent Follow-Up Project	Barbara Logan
73-55	Auto-Tutorial Programs on the Flora of Delaware	Robert Loynd

73-56	Individualized Instruction Through Science Kits	John T. Darden
73-57	Follow-Up on Sequential Skills in Science/Math -- New Castle-Gunning Bedford School District (73-15)	Barbara Logan Peter Shannon Hess Wilson

DEL MOD PERSONNEL 1973-1974

THE UNIVERSITY OF DELAWARE

Edward A. Trabant, President
Daniel Neale, Dean of the College of Education, and member of the Coordinating Council for Teacher Education
Robert Uffelman, Director, Resource Center
Carlton Knight, Component Coordinator, Science Education
John Brown, Mathematics Education
Wayne Anderson, Chemistry Education
Verne Wood, Chemistry Education

DELAWARE TECHNICAL AND COMMUNITY COLLEGE

Paul K. Weatherly, President
Ruth M. Laws, Assistant to President and member of the Coordinating Council for Teacher Education
Ethel M. Lantis, Component Coordinator
Eleanor Sloan, Librarian, Resource Center
Charles Sutcliffe, Director, Science Instrumentation Repair Center
Rick Whildin, Instructor, Science Instrumentation Repair Center

DELAWARE STATE COLLEGE

Luna I. Mishoe, President
M. Milford Caldwell, Academic Dean and member of the Coordinating Council for Teacher Education
Ralph Hazleton, Component Coordinator
Columbus Ricks, Science Education, UPSTEP Program
Leon Gardner, Director Resource Center

THE STATE DEPARTMENT OF PUBLIC INSTRUCTION

Kenneth C. Madden, State Superintendent
Randall L. Broyles, Assistant Superintendent and member of the Coordinating Council for Teacher Education
John F. Reiher, State Supervisor of Science and Environmental Education and Component Coordinator
William J. Geppert, State Supervisor of Mathematics
Thomas M. Baker, Specialist, Dissemination

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Dennis Reilly, duPont Fellow, Science
Ruth Cornell, Consultant
Richard Cowan, Mathematics Field Agent
Peter Shannon, duPont Fellow, Mathematics
Meredith L. Griffin, duPont Supervisory Intern
Thomas Hounsell, Part Time Science Field Agent

COMPONENT INSTITUTION PROJECTS

Projects conducted by Del Mod component institutions are in addition to the administrative and coordination responsibilities of those instituions. For example, each college maintains a Resource Center or conducts science and mathematics courses other than those underwritten by Del Mod. The roles of these institutions are briefly described and projects are summarized following each description.

UNIVERSITY OF DELAWARE

The University of Delaware, in addition to several science education activities, has taken a leadership role in mathematics education within the Del Mod System. The University houses a Del Mod resource center which has become a model within the University' College of Education.

73-23, 73-27

Applications of Mathematics for Secondary Teachers
Clifford W. Sloyer
University of Delaware Project
Year Duration (Two Courses).

N = 35, 29

Summary

In this course the interaction of mathematics with the real world constituted the mainstream of thought. Examples and models which were presented and discussed were chosen to elucidate the relationship between the so-called "symbol playing" of the mathematical literature and the world in which we live. Applications were chosen from the physical sciences, the life sciences, the social sciences, the management sciences, and the vocational areas. The applications were intended to be of value to teachers of students in non-academic as well as academic programs.

This course also enabled secondary teachers of mathematics to better approach, understand and evaluate the various interdisciplinary programs, many of which are presently in experimental stages.

The course reflected a direction indicated in many new programs including that of SMSG for the secondary level. In addition, recent bulletins of CUPM concerning courses in teacher training have suggested an increased stress on applications of mathematics in order that teachers can approach new programs and curricular changes with confidence.

This course was student oriented. Students were required to prepare five projects on applications of mathematics. Some of these were discussed in class, many were mimeographed and made available to the participants as resource materials. In addition, materials

prepared, in part for this course, have been made available, on a statewide basis, as resource material for mathematics teachers. Some of the materials developed in the course have been accepted for publication in **The Mathematics Teacher**, or **School Science and Mathematics**. A very positive reaction was encountered (letters indicating this reaction are available).

In addition to teachers in the course actually using, in their own classrooms, materials presented, at least one secondary school in the State has developed an entire course based on these materials.

73-28, 73-29

Chemistry Education Project
Wayne Anderson, Verne Wood
University of Delaware Courses.
Year Duration.

N = 16, 15

Summary

Courses C566 and C541 were taught in the Fall and Spring semesters and the participants in each course discussed the following topics: (C566) air pollution, sewage treatment, food additives, heavy metal poisoning, phosphates, pesticides and nuclear power. (C541) Freshmen chemistry level: the periodic table, chemical equilibrium, acid base equilibria, chemical knetics, and chemical thermal-dynamics.

Symposia and courses were evaluated by means of written comments on the part of the participants. It was hoped to have the course fulfill two different sets of objectives. First, it was thought that biology and physical science teachers would benefit from a more thorough treatment of general chemical topics. Second, that chemistry teachers would benefit from the opportunity to see someone else's approach to these topics. In practice, both objectives could not be met in the same course. The chemical background of the physical science and biology teachers was too weak for them to solve problems at the freshman chemistry major's level. A less rigorous approach is needed for these teachers.

73-44

Algebra by Computer
Rhoda Witlin
University of Delaware Course.
Spring Semester.

N = 17

Summary

Using the curriculum content of an Algebra II course, this project was designed to teach basic computer language to teachers, and to show the computer as an effective teaching tool in an Algebra II course specifically, and other math/science courses generally.

DELAWARE STATE COLLEGE

The major emphasis at Delaware State has been a program for the preparation of junior high school science teachers, the organization, and procurement of materials for the science/math resource center and limited inservice activities for junior high school/middle school teachers. Personnel from Delaware State have been very active in interaction with teachers and those from other institutions in the general planning of the activities of Del Mod and its future direction.

During 1973-1974, the Resource Center opened on a full-time basis. The two major projects conducted by the College have been:

73-31

UPSTEP - Undergraduate Preservice Science Teacher Education Program
Ralph Hazelton, Columbus Ricks
Delaware State College Project
Multi-Year Project

N = 9

Summary

UPSTEP was initiated by Dr. Ricks in 1971-1972. The program is designed to train undergraduate students to become qualified elementary or junior high school teachers. Beginning at the sophomore level, students are provided with the experiences required to function as classroom teachers. In June, 1974, the first two students completed their student-teaching and other requirements for the bachelor's degree. Each has been placed into a full-time teaching position. In addition, four UPSTEP students qualified for the Dean's list during 1973-1974.

73-32

Astronomy for Middle and Secondary School Teachers
Eshan Helmy
Delaware State College Project
One-Semester Duration

N = 24

Summary

This course was specifically designed to update and strengthen the astronomy background of elementary and middle school teachers.

Planetarium and observatory facilities were used to demonstrate teaching techniques. In addition, participants heard lectures on celestial bodies, constructed reflection and refraction telescopes, range finders, celestial coordinate systems, star finders, simulated lunar surfaces, simulated earth surfaces, sundials, and a shoe box spectroscope.

DELAWARE TECHNICAL AND COMMUNITY COLLEGE

Although only one project was conducted at Delaware Technical and Community College during 1973-1974, the Resource Center in Georgetown continues to be the focal point of Del Mod activities in Kent and Sussex counties. The use of the Center and the services provided to field agents and classroom teachers has been exemplary.

73-24

Science Education Technology
Mary Stein
Delaware Technical and Community College Project.
Year Duration.

N = 6

Summary

Activities of SET students included both class work at DTCC and interning experience in public schools. Students acquired skills in laboratory procedures, safety procedures, use of various AV equipment, inventorying, ordering from vendors, correspondence with vendors, assisting teachers in laboratory and field trips as well as classroom situations, demonstrating techniques for other students and live animal care. They also devoted considerable effort to their studies in related fields.

The Project Director's efforts were primarily aimed at instructing, tutoring and advising SET students. Early year drives in recruiting were followed by visits with employers in seeking alternate jobs for technician graduates when it became apparent there would not be technician funds available in the public schools. Outgoing activities included seeking out possible sources of funding for technician jobs and supervision of the interning students.

Project success can be measured in terms of the development of a viable curriculum for this technology, the introduction of greatly expanded laboratory investigation in the schools having intern assistance, and the written and verbal evaluations given the interns and the program by the teachers and principals involved.

Future projections for this program must be addressed to the fiscal realities of public schools. Until monies are legislated for technicians in the public schools this project will be terminated.

THE DEPARTMENT OF PUBLIC INSTRUCTION

The State Department of Public Instruction is the arm of the Del Mod System which is responsible for dissemination of information to the Delaware teachers and mentioned groups and it is the facilitator of Del Mod activities into the schools. The Department of Public Instruction works closely with the Director's office in facilitating the entry of Del Mod programs into the schools. The Component Coordinator for the Del Mod System for the Department of Public Instruction has been currently designated as the State Supervisor of Science and Environmental Education. The State Supervisor of Mathematics facilitates the activities in the mathematics content area. The field agents work closely with the supervisors in specific planning of the type of programs which will be organized for each school or teacher group with whom the agent is working. The Department also serves as the official link to the schools and to the State Board of Education.

All publication and information dissemination is the responsibility of the Department of Public Instruction. Inservice programs for special groups of teachers, statewide meetings, and general surveyance of services also fall within the general purview of the Department of Public Instruction.

When special events arise, the Department of Public Instruction has assumed the task of coping with their implementation. An example of such an undertaking this year has been the arrangement of meetings for over 700 teachers for information dissemination on the Comet Kohoutek. Another activity which is anticipated for the upcoming year is the retooling of teachers to accommodate the metric system in their regular classroom activities.

73-4

Curriculum Guidelines in Science/Math/Environment Education
John Reiher, Thomas Baker
DPI Component Project.
Year Duration, First of Two Years.

N = 24

Summary

In accordance with the Delaware Code, the Office of Science and Envoronmental Education has developed *Equinox*, minimal guidelines for the natural science education curriculum in Delaware's schools. *Equinox* has been developed at three levels: Kindergarten to first grade, second through fourth grades, and fifth through eighth grades. *Equinox* was initially developed during the summer of 1973 and was evaluated by nearly three hundred (300) teachers during the 1973-74 school year. The guide will provide the minimum standards for all science programs in Delaware. *Equinox* for the secondary schools, grades nine to twelve, will be completed in the fall of 1974. Although work has begun on the mathematics and environmental education guides, they are still very much in the developmental stage but are

expected to be completed by December, 1974. A partial product of this project is available in the forms of three booklets prepared for K-1, 2-4, and 5-8th grades.

73-7

T. I. E. S. Project
John Reiher, William Geppert, Thomas Baker
DPI Component Project.

N = 7

Summary

A program to provide awareness for computer education was held during the second week in December for district and secondary school administrators. The consultant from the T.I.E.S. Project - Mr. Thomas C. Campbell - focused the program on the system used in Minnesota known as T.I.E.S. which is a *Total Information Educational Systems* type project.

73-36, 73-47

Inservice Programs
John Reiher, Thomas Baker
DPI Workshops.
One-Day Duration.

N = 222, 425

Summary

Nine school districts, the Wilmington Catholic Diocese, and private schools conducted twenty-one DPI assisted workshops on inservice days between October, 1973 and April, 1974. Eight of these were metric workshops, seven were math activities oriented, two were science activities oriented, two were science-math curriculum development projects, and the remainder were environmental education workshops.

73-40

Metric Task Force
John Reiher, William Geppert, Thomas Baker
DPI Project.

N = 38

Summary

A working task force of educators representing all segments of the educational community in the areas of science and mathematics were called together for the purpose of developing the following:

a. A plan for implementation of metric for the State.
b. A training program for representatives from each district to serve as the leaders in the local district for metric.
c. Development of resources available for teachers of metric.

Although the metric system is useful to science and mathematics components of the Del Mod System, this project was designed to kick off statewide implementation of metric.

73-42

Comet Kohoutek
John Reiher, Thomas Baker
DPI Project.
One-Day Duration

N = 415

Summary

A series of lectures and planetarium demonstrations which focused on *Comet Kohoutek* were developed. The programs were held in the northern and central parts of the State. Participants attended a dinner, heard a guest lecturer speak on the comet and then were transported to a planetarium for a visual demonstration. Each person was given a copy of the NASA publication on the comet for use in their classroom as well as other classroom activities and a Special edition of the Newsletter which focused on the comet.

73-43, 73-45

Field Workshops - Math and Science
John Reiher, Thomas Baker
DPI Project/University of Delaware Courses.
Spring Semester

N = 125, 135

Summary

The math program was for selected teachers who are concerned about implementing math lab activities in their school. The objectives were to provide an opportunity for students to learn some of the mathematical concepts of the course in an activity - and material - centered situation, to provide the students an opportunity to see how an individualized mathematics learning environment can be created, to allow the students to become familiar with many of the recently developed materials available for use in the teaching of mathematics, and to provide teachers further experiences toward an integrated approach in the teaching of mathematics. The program was offered during the Spring semester for 50 teachers in Kent and Sussex Counties and 75 teachers in New Castle County. The program ran for fifteen sessions meeting one night per week. Sessions were held in Del Mod Resource Centers in Dover and Georgetown.

The underlying purpose of the science program was to provide teachers in grades K-4 with the basic science activities that can be utilized in the classroom, and also focus on the development of communication, listening and reading skills. The State guide "Equinox" served as the framework on which all activities of the program were based. The objectives were: identification of key activities in life, physical and earth science for implementation for the K-4 classroom, implementation of the concepts of basic learning theories and the philosophy of career education, development of key teachers in the identified districts which need upgrading as determined by the Elementary Evaluation program conducted over the past two years, and implementation of the K-4 program as developed by the "Equinox" guide. There were four groups statewide: two groups in New Castle County, One group in Kent County, and one in Sussex County. Each session focused on the following: concepts of basic learning theory, student-centered activities which relate to the general topic of session, relationship to the "Equinox Guide", minimal content background that relates to the activities, application to career awareness and implementation into the classroom.

73-46

Field Workshop - Environmental Education
Roger Daum, John Reiher
Department of Public Instruction/University of Delaware Project.
Spring Semester.

N = 32

Summary

This project was developed by the Department of Public Instruction in cooperation with the New Castle-Gunning Bedford School District for the teachers in Caesar Rodney, Capital, Conrad, Claymont and De La Warr School Districts with Funds from ESEA Title III. The purposes were: to provide instruction for K-6 teachers in basic principles of natural history, ecology, and environmental science, to encourage the utilization of available outdoor areas as teaching tools for extending and enriching classroom learning activities and to familarize teachers with existing curricular materials, resources, and instructional techniques followed by the development of field study and classroom activities. Field activities following preparatory lectures were planned to provide direct learning experiences stressing the discovery approach as a teaching format. Participants were visited at their schools by the Environmental Laboratory Program Coordinator and received assistance in using their school grrounds as an environmental study center, in conducting field trips with their students using their school grounds, and in disseminating curriculum materials to other teachers in the participant's school. Field sessions were conducted in selected areas of the field, forest, marsh, and stream communities of the Environmental Laboratory site. Occasional trips were also taken to selected habitats in Delaware.

SCHOOL DISTRICT PROJECTS

In the original 1971 Del Mod proposal there was no provision for projects initiated by school districts. During the past two years several such projects have been conducted and coordinated through the office of the Del Mod Director and the Department of Public Instruction.

These projects fall into two broad classifications: Projects conducted by district personnel with minimal use of outside help, and projects conducted with the guidance of Del Mod field agents.

DISTRICT PROJECTS CONDUCTED BY DISTRICT PERSONNEL

73-1

Mathematics Inquiry - Conrad School District
Richard Koch, Supervisor of Mathematics
District Project - Junior High School Level.
2 Weeks.

N = 12

Summary

Participants received instruction in the use of the geoboard, Cuisenaire rods, attribute games, chip trading, multibase blocks, abaci, instructional games, open-ended classification units, activity cards, geoblocks, tangrams, mirror cards, stern material, unifix rules, and logical blocks.

Presentations were made on the kinds and uses of diagnostic tests, equally acceptable multiple response answers, the units and conversions within the metric system, rounding of numbers, pentominoes, and grouping procedure.

Several junior high school teachers developed plans for team teaching of the lower-half-ability-level students in grades 7 and 8, and to develop mini-units for general mathematics in grade 9. Included were writing of objectives and selection of materials and methods of presentation.

The group was pre- and post-tested on two semantic differential scales labeled "Mathematics and Me" and "The Teaching of Mathematics". Seventeen of the materials used in the workshop were also identified by the teachers on a pre-post competency measure. This evaluation, on file in the Del Mod office, is a good indication that the workshop was successful in presenting the materials listed in the above summary.

73-2

Physical Science/Mathematics Workshop - Wilmington District
Paul Rogler, Meredith Griffin
District Project - Grades 6-8.
2 Weeks.

N = 22

Summary

The Physical Science Workshop for secondary teachers included all teachers of mathematics and science in grades 6-8.

Teachers examined new materials and made recommendations to the district for better ways of meeting the needs of the students in the district. Time was allowed for teachers to see and examine curriculum materials displayed and used at the University and the D P I. Blocks of time were allowed for teachers to demonstrate new methods and techniques for laboratory and classroom experiences.

Through this workshop teachers were asked to develop some general plans to generate interest in the physical sciences. The sequential order of the programs presently being offered in the district were evaluated. Teachers were allowed to visit other districts in groups. Consultants were invited to work with the teachers as well as to do some demonstrations.

Out of this project, which was held in June, 1973, developed the program for a special field agent for Wilmington which went into operation in October by means of a supplementary grant from the duPont Company.

The science portion of this workshop as reported by Meredith Griffin is an excellent evaluation of problems and concerns of science teachers in the Wilmington School District. Mr. Griffin subsequently became the field agent for that District, and his objectives for the 1973-1974 school year addressed themselves to these problems and concerns.

This project produced science and mathematics objectives with integrated approaches to both for urban children in grades 6-8. These objectives are on file in the Del Mod office.

73-5

Math Activities for Student Involvement - Mt. Pleasant District
Charles Eisenbise, Director, Elementary Education
District Project.
Year Duration, Second of Two years.

N = 7

Summary

Project participants were involved in discussions centering around what constitutes a good activity and how best to implement a lab approach to the teaching of mathematics. Numerous sets of existing activity cards were reviewed and evaluated. Many activities were modified to meet particular needs. In addition, new activities were designed based upon the ideas arising out of discussions with Barbara Logan.

In all, 264 activities were identified, written up, and keyed into the 12 major strands of the mathematics curriculum for grades 3-5. A teacher's guide for the implementation of these activities was developed also. The teacher's guide was printed commercially and was available in October.

The activity cards and teacher's guide noted in Number 7 demonstrate the effectiveness of the two-week workshop. The teachers who were provided with copies of the activity cards have all been very enthusiastic concerning the reaction of students and their appropriateness. These materials are on file in the Del Mod office.

Teachers in seventh and eighth grades have already begun to develop additional activities for a seventh grade lab. The utilization of the cards next year in grades 3 to 5 will provide the impetus for a similar project in grades 6 to 8.

73-8

Math Curriculum Development K-8 - Seaford District
Arthur Ellis, Curriculum Supervisor
District Project.
Year Duration.

N = 7

Summary

A K-8 mathematics guide was developed which included a sequence of concepts, skills, and suggested activities. The guide was reviewed by all mathematics teachers in the district and subsequently revised based on feedback.

The guide was approved by the Seaford Board of Education and will be used during the 1974-1975 school year. Local funds have been approved for a grade 9-12 extension of the guide.

73-11

Summer Elementary School Physical Science Workshop -
Marshallton/McKean District
Winston Cleland
District Project.
3-Day Duration.

N = 15

Summary

With the assistance of Dennis Reilly, Del Mod Fellow, a performance-based semi-individualized Newtonian Mechanics module incorporating SAPA exercises was introduced. Graphing skills, and techniques for gathering, organizing and interpreting data were utilized. In addition, outdoor activities were demonstrated.

The teachers involved in the workshop were pre-post tested and significant gains were realized in their mastery of the materials presented. Teacher comments were favorable with the conditional response that future activities should be taught in a well explained manner. For example: classroom use of the materials must be understood by the teachers.

73-13

Indian River District Mathematics Guidelines, K-8
Ralph Mahan, Math Supervisor
District Project.
Year Duration.

N = 11

Summary

Teachers from each grade, K-8, from each building in the District were involved in the production of a mathematics curriculum guide. The guidelines were coordinated with State objectives, the newly adopted district math textbook series, and with science-related math activities.

The product of this effort is on file in the Del Mod office: "K-8 Mathematics Guidelines, Indian River School District." A similar project has been suggested for K-8 science guidelines.

73-14

Caesar Rodney Activity Centered Math
Winifred Cooper
District Project.
Four-Day Workshop

N = 19

Summary

Teachers in grade two of the Caesar Rodney district were taught in the use of: geoboards, surveys, the 100 board, tic-tac-toe, number lines, pebbles in a bag, "What's My Rule?", chip trading, Kalah, pattern blocking, attribute blocks, attribute games, Cuisenaire Rods, and concepts of measurement.

Two follow-up workshops were held during the year and teacher enthusiasm was sustained. A survey of teachers indicated that the workshop was well planned, executed and worthwhile.

73-16

Environmental Education Field Studies - Wilmington District
Michael Riska
District Project.

N = 20

Summary

Mr. Michael Riska, naturalist for the Delaware Nature Education Center, conducted 10 inservice sessions with selected 5th and 6th grade teachers. These workshops were designed to provide teachers with some basic knowledge about the environment, problems with environmental control and techniques for the integration of environmental education into the mathematics and social studies programs. Since the 5th and 6th grades are organized into teaching teams the participants developed a plan for implementation of environmental education. The techniques and materials were tried out during the second semester and the results provided to the Del Mod field agent for Wilmington.

73-48

Math Computation Improvement - Alfred I. duPont District
Lawrance Furbush, Frank Marburger
District Project
Year Duration.

Summary

Topics covered in this project included the structure of the rational number system, methods of presenting algorithms, the use of the geoboard in fourth grade geometry, and the metric system. Teachers reviewed journal articles and examined the district's curriculum guide. The focus of this project was on grade-four teachers and students. The district intends to monitor student performance through the 1974-1975 year as a gauge of project success.

DISTRICT PROJECTS CONDUCTED BY DEL MOD FIELD AGENTS

73-3

K-4 Curriculum Development - Alexis I. duPont School District
Thomas Hounsell, Part-time Field Agent - Science
District Project
Year Duration.

N = 44

Summary

The Alexis I. duPont School District launched an effort toward the individualization of the School curriculum. The science activities are designed to be a part of an overall K-12 multidisciplinary program in population environment studies. A pilot program is presently in use in the elementary and middle schools of the district in grades K-6 with plans to extend it through 7th grade. This system utilizes a central card file which contains individual prescriptions for learning. The activities have no grade level or age designation and in many cases are nonsequential. This permits complete freedom of choice based on the child's interests, needs, and capabilities.

The program involved all teachers who have been trained by Del Mod in methods of science education. They acted as instructors in a series of total faculty inservice dissemination seminars. These seminars were scheduled on a regular basis so that experienced teachers might assist the rest of the staff in the use of new materials and techniques. School principals participated in the summer workshop. This enabled them to gain a more complete understanding of what teachers were doing. Consequently, they were a tremendous asset in the total implementation phase. All classrooms in the district grades K-7 had switched from conventional to individualized instruction by June, 1974.

73-6

Milford School District Science Articulation
Glenn Moyer, James Gussett
District/Field Agent Project, K-8
Year Duration.

N = 16

Summary

Funds were provided by Del Mod to pay for substitute teachers used to free regular classroom teachers during the school day. These teachers researched, designed, wrote, published and distributed a coordinated K-8 science program suggested for implementation in the Milford School District in September of 1974. Materials were also selected and purchased through this committee that were necessary for implementation. They were assisted in their efforts by Mr. James

Gussett, Del Mod Field Agent.

Two curriculum guides for grades 1-5 and 4-8 on file in the Del Mod Office indicate that Milford has responded to suggested State objectives and guidelines. The guides are sequential in nature so that teachers can anticipate future needs of children but within a given level are independent and minimal. These features should enable a teacher to take a flexible approach to the various units within each level similar to the ESS designed activities.

73-9

Science Grades 2-4 - Appoquinimink School District
Dennis Reilly, Del Mod Fellow
Field Agent/District Project
Year Duration

N = 8

Summary

As a result of a teacher survey, a science/environmental education plan was proposed. Mr. Reilly assisted the teachers in a series of monthly meetings with adaptation of the existing SAPA material in the district to the immediate environment of the schools in the district. He gave in-the-field assistance on numerous occasions to individual teachers on the mechanics of such a move. In addition, several grade-level field trips were organized. The teachers were also given assistance in using SAPA environmental materials as a vehicle for stimulating interest in reading.

73-10

SAPA and Environmental Education K-3 - Alfred I. duPont School District.
Dennis Reilly, Del Mod Fellow
District/Field Agent Project
Year Duration.

N = 23

Summary

Curriculum development utilizing environmental education was developed in conjunction with SAPA. These materials were edited and distributed throughout the district. The conclusion of K-3/SAPA curriculum development has led to the examination of 4-6th grade materials. These will be revised in the 1974-1975 school year.

73-12

Science Curriculum Study Grades 5-12 - Laurel School District
Dorothy Taylor, James Gussett
District/Field Agent Project

Year Duration.

N=9

Summary

A team of science and health teachers identified as a district need the desirability of integrating science courses with health education. A representative group met for one week during the summer with a Del Mod field agent to devise strategies for implementation. Considerable time was spent during the workshop on reconciliation of various philosophies held by participants. The resultant products were guidelines of reinforcement of some basic physiological processes and prevention of duplication of effort. Changes in staff assignment during the summer somewhat nullified the planned implementation. The agent continued to meet on a monthly basis with as many of the group as possible to lend assistance to the plan.

73-15, 73-57

Sequential Skills in Science/Math - New Castle-Gunning Bedford School District
Barbara Logan, Peter Shannon, Hess Wilson
Field Agent/District Project
One-Week Duration/Follow-up.

N=11, 8

Summary

During the one-week summer workshop, the participants attempted to identify areas of overlap in math and science. Cooperative teaching units were prepared and field tested during the school year. Units on graphing, measurement as applied in outdoor settings, and on radio were prepared.

The graphing unit was revised after use in the classroom. The length of the unit was shortened. The three units are on file in the Del Mod office. Several follow-up activities are scheduled during the 1974-1975 school year to realign science-math objectives in the district.

73-17

Primary Science Workshop K-4 - Caesar Rodney School District
Darlene Bolig, James Gussett
District/Field Agent Project
Year Duration.

N=41

Summary

A team of five teachers from the Caesar Rodney School District, each representing grades K-4, were trained by a Del Mod field agent in

SAPA teaching procedures, materials and philosophy. These five teachers were responsible for training other teachers during the school year. Classes met twice a month for eight months, and each instructor conducted at least one class at the Resource Center in Georgetown.

Teacher comments at the conclusion of the school year reflect a greater awareness of the advantages and limitations of SAPA lessons and materials. Class size was frequently listed as a problem in the coordination of SAPA lessons.

73-26

Science K-4 - Marshallton-McKean School District
Dennis Reilly, Del Mod Fellow
District/Field Agent Project.
Year Duration.

N = 29

Summary

All second and third grades in the District are using the SAPA curriculum. Fourth grades in all schools should be ready to fully implement this program in September. This was achieved by visiting each building principal and teacher involved in the program to determine needs. Follow up took the form of team meetings, work-release time, district grade-level meetings and individual classroom demonstration lessons where requested. Mote and Marshallton developed a centralized storage area while Marbrook used local classroom storage.

The program at Absalom Jones was set in motion by (1) having all concerned agree on required curriculum being SAPA Level A for first grade, and (2) gathering all available equipment and organizing a central storage in the library with an aide responsible for distribution.

This project will be continued a second year and grade four will be the subject of SAPA implementation. Grades five and six will begin to prepare for implementation.

73-37

Science Project for Claymont Middle School
Barbara Logan, Frank Gavas
District/Field Agent Project
Year Duration.

N = 5

Summary

An analysis of science program was conducted and the program was revamped to incorporate the Natural Science Objectives for the fifth through eighth grades as set forth by the State Department of Public

Instruction. The sixth grade teachers prepared sample evaluations related to the specific unit objectives. The seventh grade life science is developed on multi-text approach and the eighth grade segment includes suggested activities to accompany the specific objectives. These variations reflect an attempt to correct major areas of weakness in the former program.

Several meetings were held with the high school and elementary personnel to ensure smooth transition for the student from one level to another.

The product of this year of work entitled "Claymont Middle School Science Curriculum" is on file in the Del Mod office. In addition, the science department hopes to continue the work began to include construction of assessment items based on the specific objectives and to construct or identify a means to evaluate teacher growth.

It is also anticipated that similar efforts to better define objectives at the fifth grade level will be made.

73-38

Science Curriculum Development for Mount Pleasant Middle School
Barbara Logan, Jack Rockwell, Stewart Harrison
District/Field Agent Project.
Year Duration.

N = 16

Summary

The participants met in monthly session to identify content and to construct objectives suitable for the fifth and eighth grade science course of studies. These sessions resulted in a manual stating the overall behavioral objectives, concepts and content suggested for fifth and eighth grades.

This complements the work done last year for the sixth and seventh grades and ensures complete stepwise coverage of the minimal objectives as suggested by the Department of Public Instruction.

During writing sessions scheduled for summer and early fall, suggested activities and listing of materials needed to implement the program will be prepared.

Copies of the "Mount Pleasant Intermediate School Science Curriculum Grade 8" are available in the Del Mod office. In addition, an on-site follow up will be conducted next year to assist in the implementatio of the units developed. This follow up will include sessions on teaching techniques as well as in-classroom assistance.

73-22

Science Articulation - Stanton District
Barbara Logan, Del Mod Field Agent
Field Agent Project.
Year Duration.

N = 16

Summary

This project is the continuation of the 1971 articulation program. As the result of the consolidation of two districts the need existed for an articulated K-12 program. The task was originally assigned to the part-time Del Mod agent. Changes in administration resulted in the reassignment of the project to a full-time Del Mod field agent. The model was completed during the Fall of 1972 and revised during the Spring of 1973. In addition the group determined equipment needs for the implementation of the model. It was discovered that much of the material was on hand but needed reorganization, a task which the group proposed to do in the summer; in the interim the district purchased as much material on the recommended list as feasible.

73-25

SAPA Grades 3-4 - Capital School District
Dennis Reilly, Del Mod Fellow
District/Field Agent Project.
Year Duration.

N = 11

Summary

The Del Mod field agent met with District personnel to plan a schedule and school-by-school evaluation of SAPA. Teachers and principals were presented with new approaches to SAPA and most schools had success with SAPA during the 1973-1974 school year.

District commitment to SAPA was reflected in the acceptance of the program and of the field agent. No hard data are available to support the existence of this commitment, but the field agent has been asked to continue the program during the 1974-1975 school year.

FIELD AGENT PROJECTS

Field agent activities fall into three general classifications. Assistance to local school districts has already been described. Each year since 1970-1971, field agents have attempted to make rapid and sympathetic responses to the problems of hundreds of classroom teachers who are otherwise rather isolated in their attempts to design lessons, procure materials, and evaluate the results of their teaching. Field agents also provide the feedback which the system requires to assess trends or locate areas of strength and weakness in science teaching.

During 1973-1974, two mathematics field agents were added to the Del Mod family. There were four science field agents, two of whom worked full time in specific school districts. The other two science and two mathematics field agents were assigned to specific grade levels and specific geographical areas. Each agent had a caseload of nearly 100 teachers which included new and follow-up participants. Following in summary form are descriptions of various field agent activities other than those described previously under the title "District Projects Conducted by Del Mod Field Agents".

73-18

Field Agent Activities-New Teachers - Kent & Sussex Counties
James Gussett, Del Mod Field Agent
Field Agent Project.
Year Duration.

N = 54

Summary

Working with "new" teachers in several school districts, several objectives were agreed upon by the field agent and local district personnel. SAPA was implemented after the program had been adopted by the district and the philosophy and support for SAPA were given to these teachers. Several math-science related activities were started.

Work with "new" teachers involves a great investment of field agent time and a moderate return of concrete results. Usually, the second year of Del Mod field agent results in specific program.

73-19

Field Agent Activities-Follow up of 1972-1973 Teachers.
James Gussett, Del Mod Field Agent
Field Agent Project
Year Duration.

N = 14

Summary

Follow up of 1972-1973 teachers who worked with James Gussett was on a first-come, first-served basis. A variety of activities resulted including: assessment of Seaford's curriculum guide, videotaping, planning of field trips, and implementation of SAPA lessons.

Several of the teachers seemed to feel that the field agent was to be used as a resource rather than as a facilitator in planning lessons. James Gussett did not do teachers' work for them but assisted them to try new techniques on their own with his support.

73-20

Field Agent Activities-New Teachers
Barbara Logan, Del Mod Field Agent
Field Agent Project.
Year Duration.

N = 18

Summary

Biweekly seminars were conducted for teachers in New Castle County. Various science programs were examined and teaching stragegies were surveyed. Participants prepared demonstrations of various strategies which were presented in the seminars.

As an introduction to the Del Mod field agent concept, these seminars will be very useful in assessing individual teacher needs. Follow up is planned during the 1974-1975 school year.

37-34

Math Field Agent-New Castle County
Pete Shannon, Del Mod Fellow
Field Agent Project.
Year Duration.

N = 39

Summary

Mr. Shannon, who was new to Del Mod this year, worked in eight school districts. His activities included: an activity-oriented workshop, text selection, inservice programs, development of math labs, and implementation of DMP materials. Districts worked in were: Alexis I. duPont, Claymont, Conrad, Marshallton-McKean, Mt. Pleasant, New Castle-Gunning Bedford, Newardk, and Wilmington. Mr. Shannon's prime responsibility was follow-up activity with those teachers who were involved in previous Del Mod math-lab courses. Most of the thrust centered around the individual teacher's need and background.

73-35

Math Field Agent-Kent/Sussex Counties
Richard Cowan, Del Mod Field Agent
Field Agent Project.
Year Duration.

N = 55

Summary

Richard Cowan conducted three separate programs: Individualized Junior High School Mathematics, Metric Goals and Objectives, and Follow Up of Math Lab I. New materials were examined, and classroom activities were developed, a metric oriented curriculum guide was completed, and the field agent visited and consulted with each participant in their respective classrooms.

Richard Cowan was also new to Del Mod this year, and he had to introduce districts to his skills and talents preparatory to more in-depth treatment of mathematics instruction for teachers in each county.

73-41

Wilmington Science Intern
Meredith Griffin
Field Agent Project
Year Duration.

N = 45

Summary

The primary focus of Meredith Griffin's work was in the Wilmington middle schools. His activities included: articulation of science curricula at each grade level and between grade levels, conducting an inventory of equipment and materials needed in each school, provide support for science teachers, and revise curriculum materials to meet teacher or student needs so that there was an integration of science and reading skills.

The Wilmington "Science Curriculum Guide" is now in the hands of each science teacher and the teachers are conforming to objectives within the guide. Many of these teachers need reinforcement which Mr. Griffin plans to provide during 1974-1975.

73-54

Field Agent Follow Up Project
Barbara Logan
Del Mod Field Agent Project.
Year Duration.

N = 22

Summary

The thrust of this project was to offer supportative services to individual teachers who had worked with Barbara Logan during 1972-1973. Classroom assistance requests centered chiefly on teaching strategies or assistance with specific activities being tried for the first time.

INDIVIDUAL TEACHER PROJECTS

During the 1971-1972 operational year, it was noted that a group of teachers existed who had considerable expertise and training for whom no Del Mod programs were designed. This group had ideas for a particular need for their own situations but needed a stimulus to get started. Accordingly, a flexible program was designed by which individual teachers could receive a grant of up to $400. Support for the program came from Hercules, Inc. and residue monies from the Director's programs.

The success of the initial projects led to a continuation of this type of small grants for a second year. Several of the projects have not been completed and the funding has been extended in a number of cases.

PROJECT #	*PROJECT*	*TEACHER*
73-21	Culture Center	Robert Loynd
73-30	Alternatives to General Mathematics	William P. Fentzloff
73-33	Math/Science Lab	Philip Capriotti
73-39	Motions in Space	Helen Moncure
73-50	Basic Arithmetic Teaching Package	William Adkins Mary Pritchett
73-51	Teacher Produced Slides for the Behavorial Shaping of Math Tasks in Elementary Algebra and Physics	Thomas Townsend
73-52	Business and Consumer Math for the Junior High School Student	J. Leverne Myers
73-53	Development of Resource Center for Individualized Mathematics	Kathryn Petrick
73-55	Auto-Tutorial Programs on the Flora of Delaware	Robert Loynd
73-56	Individualized Instruction Through Science Kits	John Darden

DEL MOD RESEARCH AND EVALUATION

From 1970 to June 1974, Del Mod research and evaluation was a supportive function within the System. The problems of gathering baseline data, gathering evaluations of the 137 Del Mod projects, and maintaining records of participants were the prime objectives of the research director. In addition, several system-wide research studies were conducted by the Del Mod office.

The projection for research and evaluation during the last two years of Del Mod's existence call for a summative evaluation of the system which will require an entirely different perspective. The evaluation of the nature of the system, as well as the product of the system will be the goals of Del Mod research.

One system-wide research study conducted during 1973-1974 will, hopefully, result in the completion of the third Del Mod related doctoral dissertation. The data resulting from the study are being analyzed for this purpose by Mr. Horace Darlington, principal of Forwood Junior High School in the Alfred I. duPont School District.

37-49

Del Mod Field Agent Study
John Bolig, Horace Darlington
Research Project
Year Duration.

N = 50

Summary

The selection of two samples of twenty-five teachers each was intended to indicate the relative effectiveness of teachers with Del Mod field agent contacts and those teachers who had never worked with a field agent. A video tape analysis and a TOUS test analysis were performed.

The results of this experiment will be reported in Mr. Darlington's doctoral dissertation to Temple University. This study will be on file in the Del Mod office.

DEL MOD PARTICIPATION 1970-1974

Since its inception in 1970-1971, the Del Mod System has kept records of teachers in Delaware who are "eligible" to participate in Del Mod projects, and of teachers who have participated in the 135 projects conducted between September, 1970 and June, 1974. Almost 78% of the "eligible" teachers have been in at least one project, and the average number of projects these people have attended is 1.8.

It is difficult to be accurate in describing an "eligible" Del Mod participant. All certificated science and mathematics teachers are on the core list, but Del Mod projects have been conducted for school administrators and for elementary school teachers. All school principals are included on the core list, but only elementary teachers who have indicated an interest in Del Mod projects are listed.

Mathematics teachers have been listed on Del Mod rosters since 1970, but until this past year there were veryfew opportunities for these people to enroll in a project. Of the 677 non-participants in Del Mod projects, the majority are mathematics teachers, and a sizeable number of administrators are also listed.

The number of eligible science teachers who have not participated is small, and most of these people are in senior high schools. This is to be expected since the primary thrust of Del Mod activities has been for teachers in grades four through eight.

Participant data by School district from 1970 to June 30, 1974 are listed in Table I. During the past year each school district was sent a list of all teachers in the district who had been in Del Mod projects. In addition, the Department of Public Instruction was sent lists of participants who were to receive in-service and academic credit for Del Mod participation.

TABLE 1 PARTICIPATION IN DEL MOD PROJECTS 1970-1974

DISTRICT	Teachers on Del Mod Roster	Non-Participants in Del Mod Programs	Participants in 1970-71 (1 project)
Alexis I. du Pont	119	22	0
Alfred I. du Pont	213	70	0
Appoquinimink	58	18	2
Caesar Rodney	218	41	10
Cape Henlopen	64	14	3
Capital	178	22	19
Claymont	86	14	0
Conrad	113	33	1
De La Warr	65	13	0
Del Mar	13	7	2
Indian River	152	20	7
Kent County Vo-Tech	2	1	0
Lake Forest	80	12	2
Laurel	44	12	3
Marshallton-McKean	124	21	0
Milford	88	16	4
Mount Pleasant	110	21	0
New Castle County Vo-Tech	21	9	0
New Castle-Gunning Bedford	164	37	1
Newark	236	95	0
Seaford	70	19	2
Smyrna	56	15	1
Stanton	76	25	1
Sussex County Vo-Tech	2	0	0
Wilmington	256	48	0
Woodbridge	48	13	3
Del State Students	15	0	0
Del State Staff	11	5	1
Del Tech Students	6	0	0
Del Tech Staff	11	4	0
U. Del Students	49	2	0
U. Del Staff	21	10	0
State Agencies	18	2	0
D.P.I. Staff	19	5	0
Del Mod Staff	5	3	0
Private	38	2	0
Parochial	200	26	3
TOTALS	3049	677	65

- TABLE 1 Continued -

DISTRICT	Participants in 1971-72 (25 projects)	Participants in 1972-73 (52 projects)	Participants in 1973-74 (57 projects)	Total Number of Project Participants	Ratio of Projects per Participant
Alexis I. du Pont	49	46	82	177	1.82
Alfred I. du Pont	28	61	118	207	1.44
Appoquinimink	3	28	31	64	1.60
Caesar Rodney	27	62	299	398	2.24
Cape Henlopen	7	31	43	84	1.68
Capital	56	116	197	388	2.48
Claymont	22	27	89	138	1.91
Conrad	14	30	109	154	1.92
De La Warr	11	20	52	83	1.59
Del Mar	3	5	3	13	2.16
Indian River	29	79	180	295	2.23
Kent County Vo-Tech	0	0	1	1	1.00
Lake Forest	35	35	42	114	1.67
Laurel	5	5	29	42	1.31
Marshallton-McKean	54	75	104	233	2.26
Milford	22	29	108	163	2.26
Mount Pleasant	26	48	90	164	1.84
New Castle County Vo-Tech	1	2	11	14	1.16
New Castle-Gunning Bedford	50	47	114	212	1.66
Newark	25	87	83	195	1.38
Seaford	10	38	53	103	2.01
Smyrna	12	25	35	73	1.78
Stanton	22	34	52	109	2.13
Sussex County Vo-Tech	0	0	2	2	1.00
Wilmington	17	141	173	331	1.59
Woodbridge	3	4	46	56	1.60
Del State Students	8	12	17	37	2.46
Del State Staff	1	3	6	11	1.83
Del Tech Students	0	4	5	9	1.50
Del Tech Staff	1	1	10	12	1.71
U. Del Students	17	15	35	67	1.42
U. Del Staff	0	1	14	15	1.36
State Agencies	0	2	15	17	1.06
D.P.I. Staff	2	2	11	15	1.07
Del Mod Staff	0	0	3	3	1.00
Private	3	7	34	44	1.22
Parochial	50	93	96	242	1.39
TOTALS	613	1215	2392	4285	1.80

WHAT HAS BEEN LEARNED

The introduction of mathematics into the Del Mod System as a full partner was an important step in the development of the System. Since 1971, several aspects of science and mathematics had been projected for inclusion into or deletion from the System and the employment of math field agents was the culmination of several years of planning.

Since the administration of the System was well established, and the concept of field agents had been "sold" to the schools in Delaware, the addition of mathematics was very efficiently integrated into Del Mod.

When Del Mod began there was no provision for awarding grants to the various school systems. This was remedied in 1972-1973 and again in 1973-1974. These grants for small amounts of money enabled districts to plan curriculum guides or to conduct programs of articulation. The effect of these activities was to prepare districts for optimum use of Del Mod field agents and Del Mod resource centers.

Local district grants will no longer be funded since they have no future usefulness, but they were a success in most of the districts involved. In its final two years, Del Mod will concentrate on programs which will enable local districts to use the materials which were developed in these projects.

Equipment repair became a function of the Del Mod System during 1973-1974. This activity was conducted in the Delaware Technical and Community College component as a response to a demonstrated need in many secondary school science laboratories. It is too early to comment on the success of this venture but it is probably unique. School districts are scheduled to send various broken apparatus to this center where attempts are made to replace lenses, etc.

The curriculum resource centers in the three colleges were all open for business during the year. Delaware State College in Dover opened its resource center doors in January. In operational philosophy it is expected to serve both inservice and preservice teachers equally. The centers at Delaware Tech and at the University place heavy emphasis on inservice and preservice respectively.

For the second year, the Department of Public Instruction employed the services of a dissemination specialist to augment the activities of the State Science Supervisor. This role was critical in informing teachers about science, environmental, and mathematics news during the year. Three newsletters: Del Mod News, Relations, and Metric In Delaware were produced at regular intervals during the year.

During the last two years of Del Mod's planned existence two objectives will be the primary focus points. The first will be the assimilation of various Del Mod activities into existing State institutions. This has begun with the University of Delaware take-over of all field agent activities. The resource centers are also projected for long lives within each component.

This year the state legislature granted to the Department of Public Instruction $15,000.00 for inservice work in science and mathematics as part of the Del Mod System. This is part of the Departments phase-in process.

The second objective is to evaluate the System and its production from 1971 through 1975. It becomes very important that Del Mod justify its existence in terms of objectives and outcomes and monies spent.

When Del Mod was originated in 1971-1972 there was no provision for long-range formative evaluation. The collection of baseline data was undertaken by the present Research Director, but as the System grew the baseline data alone were not sufficient to describe the nature of science and mathematics education in Delaware in a pre-post design. Furthermore, the Del Mod objectives as originally stated are not presently judged specific enough to be measured objectively.

As the emphasis on evaluation becomes greater, a major effort will be made to examine and measure changes in Delaware which can be attributed to Del Mod. The effort will require a different mode of thinking by many of the key individuals within the System, and it will require a greater commitment to evaluation by all concerned components.